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CONTRIBUTORS

HENRY S. ANDERSON *is assistant professor in the department of economics at Stanford University, California.* G. E. FUSSELL *of the Great Britain Ministry of Agriculture and Fisheries is an authority on English agricultural history. He has recently completed a MS. on "The Rural Economy of England in the Eighteenth Century." Some fifteen of his essays on this subject have been printed in various periodicals, including two in Agricultural History. See its numbers for October, 1929, and October, 1930.* HERBERT S. SCHELL *is associate professor of American history at the University of South Dakota, Vermillion, South Dakota. He received his doctor's degree at the University of Wisconsin in 1929 and is engaged in research in the history of South Dakota.*

AGRICULTURAL HISTORY

VOLUME V OCTOBER, 1931 NUMBER 4

THE LITTLE LANDERS' LAND COLONIES: A UNIQUE AGRICULTURAL EXPERIMENT IN CALIFORNIA

HENRY S. ANDERSON

An important phase of agricultural history is that which deals with land colonization. This process includes any method of promoting the settlement of a district, instead of allowing it to take place spontaneously. During the westward movement of agriculture in the United States, many land colonies were founded, and when California became a part of our agricultural domain, such projects were soon undertaken.

In the year 1857, the first irrigated colony in the state was founded near the Santa Ana River, about 35 miles from Los Angeles, and given the name of Anaheim. This project was undertaken by a group of fifty cooperators, who purchased the land at a price of $2 per acre and secured water for irrigation by merely diverting it from the river. At the end of two years the affairs of the settlement were closed, and each settler received as his share of the venture a 20-acre farm, which had been partially planted to vines, together with a town lot, and a water right, at a cost of $1,400.

The success of this colony caused others to be founded within a few years. Some of these were the citrus settlements at Riverside, Redlands, Pasadena, and Pomona. Others were located near Fresno, in the San Joaquin Valley, and formed the basis of the raisin industry. As the years passed, the Sacramento Valley was gradually colonized, as irrigation facilities became available.

In all of these settlements, however, the individual holdings were of moderate size, averaging about 35 acres each, and there was no strong social bond among the settlers. If cooperation

existed, it was incidental to the carrying on of some particular activity, and the settlers apparently did not regard their membership in the colony as membership in a socially organized group.

Soon after the beginning of the twentieth century, a new plan of colonization was undertaken; founded by William E. Smythe and known as the Little Landers movement, it forms a unique chapter in the history of land colonization in California. The basic idea underlying the venture was the establishment of groups of families upon small holdings, containing from one to five acres of land. It was the expectation of the founder that each of these small farms, carried on under conditions of cooperation in regard to various activities, such as purchasing and marketing, would provide a living for a family. It was thought that a colony operating under such a plan would develop almost immediately a solidarity of feeling, and a most satisfactory social life. In short, the settlers were to be not only agriculturists, but also members of a well organized, compact, social group.

In treating certain of the earlier phases of the colonies, use has been made of an unpublished manuscript which presents the results of an investigation of these projects, made in 1916 by Dr. M. S. Wildman (d. 1930) of Stanford University, and Dr. R. L. Adams of the University of California, to whom acknowledgment is due.

The first gathering of persons interested in the Little Landers movement was held in San Diego in the latter part of July, 1908. As a result of this and subsequent meetings, the first colony, named San Ysidro, in honor of the Spanish patron saint of agriculture, was established in the autumn of that year. After a number of tracts of land had been carefully considered as sites for the new venture, a location was finally chosen in the Tia Juana Valley, in San Diego County, about fifteen miles south of the city of San Diego, and within two miles of the international boundary. In the founding of this first settlement, Mr. Smythe, the "father" of the movement, had as associates a number of business and professional men of the vicinity. This group later transferred control of the project to the colony itself, which was organized under the name of "Little Landers, Incorporated."

The total area purchased for the first experiment was about 550 acres, and the prices paid by the settlers ranged from $100 to $500 per acre. The soil of the colony at the time of its founding could be classified under two general heads: (a) sandy sediment loam in the Tia Juana river-bottom, and (b) a variable mesa, or upland, type, similar to that which in general constitutes the lower benches of the Coast Range in the vicinity. The river-bottom soil was practically ruined for agriculture by a flood in 1916, as it was changed to sandy silt and pure sand. The types of soil in the colony range from sand to adobe, with an evident lack of organic matter. In topography, the land consists of gently rolling hill slopes, ranging in elevation from a few to two or three hundred feet above the river-bottom, the high elevations merging into distinct hill slopes. The land, formerly used as a grain ranch, had been greatly deteriorated from constant cropping when purchased as a site for the colony. The site, however, possessed two advantages, a favorable climate, and an ample water supply, which was obtained from a pumping plant built in the river-bottom.[1]

To this settlement, then, established under the foregoing conditions, came the colonists, from all sections of the United States, and from many walks of life. They were, in general, people who had saved a small sum from moderate earnings, and were resolved to achieve independence upon the land. They were usually of a fair degree of intelligence, but with little experience in agricultural work. They arrived at San Ysidro imbued with faith in the Little Landers movement, optimism as to its outcome, and a determination to succeed. Practically none of the colonists hoped for wealth as the result of their ventures. They did expect to gain a moderate living, earned under conditions of security of employment, and freedom to direct their energies as they chose.

The expectations of Founder Smythe, in regard to cooperation among the colonists, were soon realized. The form of government adopted by the group was that of the New England town meeting. In the possession of the writer is a photograph of

[1] R. L. Adams and M. S. Wildman, MS. Report on the Little Landers' Colonies, 15.

the first meeting at San Ysidro. This presents striking evidence of the diversity of the colonists. Mr. Smythe's countenance indicates his true character, that of the dreamer and idealist. Middle aged at the time, with energy somewhat slackened by years of work in connection with various agricultural projects which had not always fulfilled his expectations, he made his final major effort as founder of the Little Landers movement. Although it is true that he made, from time to time, serious errors of judgment in connection with the colonies, it is also true that the great majority of the colonists held him to be lacking neither in sincerity nor in honesty.

Upon a tablet fastened to the wall of the clubhouse of the colony, Mr. Smythe set forth his creed as follows:

"The Hope of the Little Lands"

"That individual independence shall be achieved by millions of men and women, walking in the sunshine without fear of want.

"That in response to the loving labor of their hands, the earth shall answer their prayer: 'Give us this day our daily bread.'

"That they and their children shall be proprietors rather than tenants, working not for others but for themselves.

"That theirs shall be the life of the open—the open sky and the open heart—fragrant with the breath of flowers, more fragrant with the spirit of fellowship which makes the good of one the concern of all, and raises the individual by raising the mass."

As soon as the colony was well under way, a community store was established, and shortly afterward in San Diego a market was opened for the sale of products. Meanwhile the colonists worked with great energy in developing their holdings. Gardens were planted, poultry houses and rabbit hutches built. The settlement had been in operation but a short time, however, when difficulties began to appear. The settlers were for the most part unskilled in agriculture, and the bulk of their products proved to be below standard quality. Furthermore, the good articles, especially the vegtables, came from the holdings on the more fertile river-bottom land. Yet, as the market was a community affair, the colonists on the upper lands expected as much per pound for what they raised as the others received.

This situation caused much friction in the town meetings, and

finally a number of settlers who were producing superior crops stopped dealing with the community market, and began to make sales as individuals. The market, thus deprived of its better goods, soon lost trade, and was finally closed. The store at the colony was operated for some time afterward, but finally began to make credit sales to settlers, and was unable to settle its own indebtedness promptly. This matter caused a further lack of harmony at the town meetings, and the store was finally sold, at a considerable loss, to a private purchaser.

Although the failure of these two enterprises was a severe blow to the colonists, a still greater trial was in store. Early in the year 1916, over sixty of the settlers lost their homes in the flood which has been mentioned as having destroyed the soil in the river bottom. Mr. Smythe and the more prominent colonists had strongly urged, from the beginning, that no dwellings be located within reach of flood waters. The holders of the lower lands were advised to build upon their mesa town lots, included with each sale of land in danger of inundation. In spite of the risk, some sixty colonists persisted in building in the river-bottom, and thereby lost practically all their possessions when the flood finally came upon them.

They were not deserted in their time of need, however. Before the water had subsided they were established in a large tent, and supplied with necessaries willingly contributed by the other members of the community. Relief funds were soon received from outside sources, and the victims of the disaster gradually rehabilitated themselves. A number began new holdings upon the higher ground, and the remainder left the colony to establish themselves anew elsewhere.

The damage from the flood proved to be discouragingly great. Not only had much of the better land in the colony been rendered worthless for agriculture, but the pumping plant, upon which irrigation depended, had been swept away. This had been paid for by a bond issue, at a cost of over $25,000.

These losses combined to lower the morale of the settlers. Furthermore it was becoming evident that making a living upon the colony holdings involved more hard labor than most of the

colonists had ever before performed. This excessive manual labor was made necessary by the small size of the holdings. The majority were about one acre in size, and upon a "farm" of this area, very little, if any, animal or machine power can be employed. Hence the colonists were obliged to use manual labor almost exclusively, and to sell their crops, cultivated by hand, in competition with similar products raised under more efficient methods of production. The result was that the settlers found themselves unable to realize an adequate return for the large amount of labor expended upon each unit of product.

In 1918 a new disaster befell the unfortunate venture. Nearly all the colonists had purchased their land on credit from the colony corporation. This organization, in turn, still owed the original owners part of the purchase price. As each settler finished his payments to the colony corporation, the latter was supposed to clear the title to that particular allotment. This, however, in some cases it did not do, but instead used the money for other purposes for which it was urgently needed, such as the installation of an emergency pumping plant after the flood. As a result of this sort of finance, a number of settlers were obliged to pay additional sums in order to obtain a clear title to their holdings. There was no question of criminality involved, however, and as the assets of the corporation were practically nil, there was nothing to do but to pocket the loss.

By the end of 1918, the colony was an evident failure. The affairs of the corporation were closed, many of the remaining settlers left, and the few who remained were those who were possessed of outside sources of income. In March, 1925, the writer visited San Ysidro, and after a careful search could find but four of the colonists, and of these but one was living upon his original holding.

The San Ysidro of today is a thriving hamlet, built upon the ruins of the original colony. Its prosperity, however, is due for the most part to its nearness to the Mexican resort of Tia Juana. Few traces of the Smythe project are discernible in the present settlement.

The second Little Landers' colony, founded about four years

after the first, was called Los Terrenitos, the Spanish for "little lands." It was located about 17 miles from Los Angeles, in Monta Vista Valley. Associated with Mr. Smythe in this venture was Mr. M. V. Hartranft of Los Angeles. A corporation called the Western Empire Suburban Farm Association was organized with 340 stockholders, and a tract of 1700 acres purchased. Part of this area was subdivided into small holdings, and in March of 1913 a sales campaign was begun which continued for about a year. The selling price of the land averaged about $800 per acre.

It is strange that in the establishment of his second colony, Mr. Smythe did not profit by the errors made at San Ysidro, yet such is the case. Not only were the holdings at Los Terrenitos too small, in most cases about one acre, but the quality of the land was even worse than that used for the first colony. The soil consisted of a heterogeneous mass of granite rocks and boulders, interspersed with sand, gravel, and some silt. The labor required to prepare this land for planting—chiefly the removal of stones—was very great indeed. Estimates of the cost of hiring this labor ranged from $500 to $1000 per acre.[2] The character of one "farm" appears in a photograph taken by the writer in January, 1925, which shows a dwelling of five rooms situated on a lot 80 by 100 feet in size which once formed part of the acre holding of a colonist. The building is entirely faced with stone, and the owner found it necessary to purchase but a few large units of this material. The balance was taken from the lot without exhausting the available supply. It was upon land of this sort that the attempt was made to establish the second Little Landers' colony.

As at San Ysidro, the town meeting form of government was established. But there soon appeared important differences between this project and the first Smythe venture. The settlers as a group proved to be much better off financially than those at San Ysidro, and a much smaller proportion attempted to make their entire livings from their holdings. This was fortunate,

[2] *Ibid.*, 21.

considering the character of the soil, and the fact that water could be had only at meter rates. Another factor of the situation was the early discovery that the tract possessed great possibilities as a suburban district of Los Angeles. As the land is situated at an elevation of from 1500 to 2200 feet above sea level, and as the entire district affords splendid views of mountain scenery, it is a most delightful place in which to live. It therefore came about that the influx of population solved quite satisfactorily the problem of the outcome of the project. By the time that the colonists became convinced that a living could not be made from their holdings, and were ready to abandon their ventures, it was found that an acre "farm" could be subdivided into eight lots which would bring from $400 to $800 each. The prospective agriculturist, therefore, disposed of his land, pocketed his gains, and went away well satisfied, in most cases, with his experiment.

From 1917 onward, the district gradually lost its character as a Little Landers' colony. The affairs of the founding corporation were closed, the town meetings discontinued, and the name of the postoffice changed from Littlelands to Tujunga. Today the prosperous residents of the district do not know, for the most part, that their town is built upon the ruins of a Little Landers' colony. At the time of his visit in January, 1925, the writer was able to find at Tujunga but one person who had been one of the original settlers. It was still possible to find, in a few instances, physical traces of the original settlement. The second Smythe project, therefore, proved to be a complete failure as an agricultural colony, but a fairly satisfactory financial venture for most of the colonists.

The third, and last, Little Landers' colony was situated upon the hills above the town of Hayward, Alameda County. In the selection of the name, Hayward Heath, for the new settlement, Mr. Smythe stated that he desired to link the project to the town of Hayward, and also to perpetuate the name of the town of Hayward's Heath, on the Sussex Downs in England, a region noted for its agriculture.[3]

[3] W. E. Smythe, *Hayward Heath* (1915), 24.

The project of Hayward Heath was originally organized as the Modern Homestead Association, and was based on an idea which had been successfully carried out in earlier years by the California Home Extension Association of Los Angeles. This was the plan of organizing large clubs of homeseekers who should pay ten dollars each for a certificate of membership, and then purchase large tracts at wholesale, for subdivision and distribution to the members. In this way it was hoped that a very large saving would be made in the matter of price, and that possibly various other advantages would be obtained. The company expected to operate on a margin of 20 per cent, out of which all expenses for promotion were to be paid, and a reasonable profit realized. It was expected that the Little Landers' colonies would develop as an incident of the broader work, and would be composed of the members who desired to occupy small holdings near the cities. It was believed, however, that there would be a much greater demand for orchards, dairy farms, and stock ranches.[4]

A series of lectures to promote the project was begun in Oakland, in September, 1914. As a result of the use of Little Landers illustrated material, the entire following concluded to undertake this form of agriculture, and it was decided to organize a Little Landers' colony. Five hundred acres were selected from a tract of 2300 acres in the Hayward hills, and placed upon the market at prices ranging from $325 to $1200 per acre. An active campaign for members was also begun in San Francisco, in March, 1915.[5] The sales pamphlets, written by Mr. Smythe, were attractive in form and content, and proved to be effective in inducing investment in the enterprise.

Success, however, was not to be had, for again at Hayward Heath, as in the earlier colonies, Smythe made the fatal mistake of attempting to found a colony upon poor hill land. In the pamphlets the author attempted to minimize the disadvantages of the location by use of the following expressions,—"the strength

[4] Adams and Wildman, *op. cit.*, 5.
[5] *Ibid.*, 6.

of the hills,"[6] "the sweet hills of Hayward,"[7] "the people of the future are going to live upon the hills."[8] In regard to the soil, most of which was obviously poor, the pamphlets read as follows: ". . . . no soil, in its natural state, is good enough for the Little Lander, and none is such that it cannot be made good enough by work and artificial enrichment, ... for the soil is like folks. It wants to be loved, and the more you love it, the more it will love you."[9]

As a result of the flowery language of the pamphlets, of which the foregoing may serve as examples, and of the other sales efforts of the promoters, some sixty families were established on the land by the summer of 1916. Again the town meeting was organized, as in the earlier colonies, and the settlers made determined efforts to realize Smythe's ideal, as expressed in the words of Bolton Hall—"a little land and a living." The struggle could not be won, however, under the prevailing conditions. Most of the land consisted of sand, or sandy loam of poor quality over stiff clay, and fair farming land existed only in spots. To add to the difficulties of the colonists, the water supply was scanty, and furnished at the prohibitive rate of ten cents per thousand gallons. There was no sales market nor community store established in the new colony, and the settlers sold their product as best they could. Not a single family at Hayward Heath succeeded in making its living from its holding. In most cases they supplied the deficiency in income from their resources until these were exhausted, and then abandoned the venture. By the year 1920, the colony, as such, was practically defunct. One unfortunate phase of this project was the fact that, as at San Ysidro, there was practically no increase in land values during the life of the project. The loss, therefore, in many cases was practically total, as the holdings proved to be unsalable at any price, and were simply abandoned.

In February, 1925, the writer visited the site of this colony

[6] Smythe, 21.
[7] *Ibid.*, 22.
[8] *Ibid.*, 22.
[9] *Ibid.*, 23.

and found its appearance to be most depressing. At San Ysidro and Los Terrenitos, other forces had located thriving settlements upon the ruins of the colonies, but at Hayward Heath the district had assumed a desolate appearance. Five of the settlers were found to be still upon their holdings. These were elderly people with an outside source of income, who had paid for their places, and had found the locality to be a healthful place of residence. They were making no apparent efforts still to carry on Little Landers activities. About the only reminders of the colony were some abandoned cabins, the deserted school house, and the remains of the "demonstration acre" holding. This model "farm" was originated by a colonist named Taylor who was the instructor in agriculture for the settlement. He was directed by the founder to select the "fairest" acre in the tract to serve as an illustration of correct methods of intensive farming. He selected an acre overlooking the Hayward Valley and built a small cottage near the main road of the colony. A member of the original group of settlers informed the writer that Taylor's influence in the colony was really remarkable, and that if the colonists had lacked his advice they would have lost more heavily than they did, in many cases. He undoubtedly did the best that could be done under the circumstances, but finally realized that the colony would fail, in spite of his efforts. This knowledge caused a general break down in health, and he was obliged to seek hospital treatment. The colonists watched his condition from day to day, and the news of his death saddened the entire community. At the time of the writer's visit to Hayward Heath, the Taylor cottage was still standing just as he had left it and was still given some care by neighbors who had known him. The record of this man shows the value of the instructor in land settlement projects. Although the colony failed, perhaps his work may be considered at least a partial success, even though he should have known from a preliminary survey that the project could not be made to yield adequate returns.

Mr. Smythe did not witness the final outcome of Hayward Heath. In February, 1919, he became associated with the late Franklin K. Lane, then Secretary of the Interior, in connection

with a plan to extend the reclamation movement to the entire United States, and thus passed from the picture of the Little Landers' colonies. He died in New York on October 27, 1922.

In conclusion, it may be said that the history of the three projects illustrates important truths. First, that no land colony can be made a success unless it is located upon moderately priced, fertile land, with an ample and inexpensive source for irrigation. In the second place, while it is possible for a family to gain a living from an acre or two of land, a much larger income may be had from a larger area, with but a slight increase in the overhead expense. Finally, there is a place for groups of small holdings operated in quasi-Little Landers fashion, in suburban districts where adequate transportation facilities not only facilitate the operation of the "farm," but also permit the gaining of some outside income by one or more members of the family. Such an arrangement may well yield great comfort and happiness, even though both the holding and the pecuniary income be small.[10]

[10] The Runnymede Colony, founded near Palo Alto in 1916, by Charles Weeks and Peter Faber, has been mentioned occasionally as a Little Landers colony. This title, in the opinion of the writer, is a misnomer as applied to this settlement, since its basic plan was specialization in poultry rather than diversified intensive agriculture. The colony was in fact advertised by Mr. Weeks as "Runnymede, the Charles Weeks Poultry Colony." Possibly the confusion has arisen because Mr. Smythe was engaged by Messrs. Weeks and Faber to assist in the advertising campaign when the project was opened for settlement.

JOHN WYNN BAKER: AN "IMPROVER" IN EIGHTEENTH CENTURY IRELAND

G. E. Fussell

Our chief authority describing the state of agriculture in eighteenth century Ireland is Arthur Young, who made his well-known tour between the years 1776 and 1779. Generally the agriculture of the country was very primitive, but, as in England at the same date, there were areas of improved agriculture embodying all the leading methods both in the latter country and on the Continent. The prevalent system was, however, the most primitive, the potato culture of the cottars in the South, and the continuous oat cultivation till the land was exhausted, after which it was allowed to fall down to weeds and grass, practiced by the linen weavers of the North. On the larger holdings the naked fallow system was common, and on the poorer soils almost necessary, but legume rotations, both partial and fully developed, were also found. The "new" grasses were cultivated in some parts, and some landlords, following the example in England, derived, as that was, from Flanders, were experimenting with turnips and clover. Still Young found much to find fault with and a great deal of misunderstanding of the improved system and the measures necessary to make it a success.[1]

Ernle has said that "the great changes which English agriculture witnessed as the eighteenth century advanced, and particularly after the accession of George III. (1760), are, broadly speaking, identified with Jethro Tull, Lord Townshend, Bakewell of Dishley, Arthur Young and Coke of Norfolk."[2] In Ireland one of the outstanding names with which the progress of agriculture can be similarly identified is that of John Wynn Baker

[1] N. S. B. Gras, *A History of Agriculture in Europe and America* (New York, 1925), 185–187.

[2] Lord Ernle, *English Farming, Past and Present* (London, 1927), 149.

(d. 1775). Like many more men of that century Baker was apparently a man of vigorous imagination, not unstimulated by the progress of the day, and it seems to have been the failure of a scheme, a little "wildcat" in type, which led him to settle in Ireland in 1761. "He had been engaged in a great and arduous scheme of conveying salt brine from some pits near the Severne, to that river in pipes a considerable distance, in order to extend the market by selling upon cheaper terms. By an indefatigable attention he had bought strips of land so as to connect the river and the pits; but when it was found by the people interested, that he would ruin all the old works, they cut his pipes, ruined, and drove him out of the country at a moment when he was sure of making at least 20,000 l. a year by the project."[3] Although, like most other people Baker may have been inclined to overestimate the probable gains from a scheme which had failed, he was not a man to be easily submerged, and he proceeded to Dublin, where he published his *Some Hints for the better Improvement of Husbandry* in 1762; this book, which does not seem to have survived,[4] introduced him to the Dublin Society. He took advantage of this to suggest a scheme for an experimental farm for public exhibition of a type which we should now call a demonstration. The Society gave him a salary of £200 a year and a small grant in aid of the scheme, whereupon he took a farm of 354 acres at Laughlinstown, nine miles out of Dublin. He described the experiments there carried out in a series of annual reports covering the years 1764 to 1773. During that time he also published a number of other works, of which Young gives the following list: *Practical Agriculture epitomised; Considerations on the exportation of Corn; Address to the Representatives of the People; The Reclaiming and Cultivation of a Bog in the county of Kildare;* and an abridgment of Young's *Six Weeks*, and *Six Months Tours*. In 1765 the Society also assisted Baker with a grant of £300 in establishing a factory for making implements, and he was able

[3] Arthur Young, "Some Particulars Relative to the Late John Whyn Baker," in *Annals of Agriculture*, 8 (1787): 125.

[4] See, however, the note to the bibliography below. The book is also referred to in *Museum Rusticum et Commerciale*, 5 (1765): 267.

to sell a large number of his products before the factory was destroyed by an accident of fire two years later. The implements are described in *A Short Description and List* which was appended to the report issued in 1767 and again to that issued in 1769.[5]

Young regarded all these publications as very valuable, especially the annual reports, and would have been pleased to edit them for publication in England, where they were very scarce, if any bookseller would have been prepared to guarantee him against loss, but apparently none was to be found who would do so. This opinion of the value of Baker's work was shared by the Royal Society, which elected him a fellow in 1771, and by the Royal Society of Arts. Under the auspices of the latter Society, Robert Dossie was enabled to issue his *Memoirs of Agriculture and other Economic Arts* (1768–82), a periodical designed to give to the public the benefit of some of the communications received by the Society; in the preface to the first volume Dossie tells us that the Society received many letters from foreign countries, and adds: "There is yet another source of information relating to agriculture, that should not escape our notice. It is the reports made, from year to year, by Mr. Wynn Baker, of the effects of his trials and experiments; which are performed under the protection, and with the support of the Dublin Society; and conducted by him with ingenuity and judgment. Though these reports are published by Mr. Baker in Ireland; yet they come to the hands of very few here: but, by their being inserted in this work, the public may reap the full advantage of them: as they will be thence laid open to all, who may wish to peruse them." The *Dictionary of National Biography* indeed in its very brief notice of Baker says that in his short life he did more for the advancement of agriculture in Ireland than any of his predecessors. Baker also contributed to the *Museum Rusticum et Commerciale*, a contemporary periodical, which printed some notices of his experiments.[6]

Young, as we have seen, appreciated Baker's work highly, but

[5] *Annals of Agriculture*, 8 (1787): 125–126.

[6] See 5 (1765): 257–281; 6 (1766): 220–228, 268–271, 280–287; earlier papers also in 1: 339–349 and 2: 268–275.

he did not hesitate to criticize him, even before he wrote the obituary quoted above. In 1767, in words that might almost be repeated by a modern scientist, he warned his readers against accepting the evidence of short period experiments as generally conclusive. After discussing that all important subject of the eighteenth century, the sowing of wheat in drills and the need for a series of accurate experiments with costs from which proper conclusion could be drawn, he said, "Mr. Wynn Baker's few experiments are very judicious and conclusive: but the reader should be extremely cautious of ever giving the same credit to the calculations of a term of years drawn from an experiment of one or two, as to the immediate circumstances of the experiment itself."[7] Young indeed did not think the Tullian husbandry any more applicable to Ireland than to Tierra del Fuego, and considered Baker's early preoccupation with it one of the faults of his system, as was his neglect of the turnip and cabbage culture, two great points in the minds of all eighteenth century improvers. Baker had done some early experiments on cabbage and turnips, but he did not carry them out on the farm in large; indeed the farm was without turnips till 1768 and they did not play a large part in its economy thereafter. In 1770 Baker began some experiments with clover, but Young complained that he did not use it in any connected system, nor did he introduce the Norfolk four course of wheat, turnips, barley, clover, or any modification of it. After 1772 the experiments were on perch plots, and Young did not think they were very systematic nor likely to have any great influence on the agriculture of Ireland. His experiments, in spite of these defects, were acknowledged to be far the most minutely and carefully accurate of any Young had observed, and in addition to the encomium of Dossie in the *Memoirs*, the Royal Society of Arts voted him a gold medal inscribed with a congratulatory notice. In spite of all this appreciation, however, Baker's life was not a bed of roses; he found himself opposed on many grounds in the committee of the Dublin Society. One of his most pertinacious enemies seems to have been Matthew Peters,

[7] *The Farmer's Letters to the People of England* (London, 1767), 130.

who preferred green manuring to the dunghill, and was opposed in this opinion by Baker. Young says this man "published something, I know not what, upon the subject." This is nothing more than a piece of heavy sarcasm on Young's part because Peters published three books, and so great an enthusiast as Young must have known these.[8] The Society certainly seems to have been somewhat unjust in the pin-pricking criticism of their supervisory committee, and Baker died in poor circumstances, saying that the injustice of their suspicions over a very small sum of money had broken his heart.[9]

Baker, himself, seems to have been a man impatient of criticism, because he complained in the preface to his second annual report of criticism levelled at the first. Readers, he said, had expected a system of husbandry when he only offered experiments carried out during one year. Such a system as they had expected would occupy the whole of a man's life, if it were done conscientiously. He then entered a protest, like so many other practical experimenters of the day, against the book-farmers. "It might be an easy task," he said, "for a Bookseller's Slave to undertake a work of that kind, because he may be furnished with books enough, from which to extract his matter, and then give it the Title of a Complete System." Baker was however seeking for experimental matter on which to build a system, "and they may rely upon it, I shall never deal in Pompous Title Pages, to cover the meanest of Theft, Plagiarism." He then promised that when he had obtained enough information, if he lived long enough, he might produce a System of Rational Agriculture, and he asked other experimenters to let him have the results of their trials to aid in the production of such a work.

Even at that early date, when he had only been established two years, Baker found the sale of his implements so good that he warned intending customers that they would have to wait their turn for delivery, and the list of implements he supplied was very

[8] *The Rational Farmer* (Newport I. W., 1770); *Winter Riches* (London, 1771); and *Agricultura; or, the Good Husbandman* (London, 1776). See also the writer's "Matthew Peters, Civil Engineer and Book Farmer," in *Notes and Queries* (1928).

[9] *Annals of Agriculture*, 8 (1787): 127–133.

extensive so that this is comprehensible. The complete list was not first published until 1767, but it contains all sorts of ploughs, the drill plough, drill harrows, hoe plough, a single and double cultivator, wagons and carts and harness.

In this issue of his report he also advertised a register for servants, and offered instruction to ploughmen in the use of the drill implements and to bailiffs in his system of farm bookkeeping, so his activities became increasingly varied and multitudinous.

Perhaps a sufficient indication of the nature of his demonstrations has been given above in Young's remarks upon them, but he also had tried burnet, lucern, sainfoin, timothy and parsley as well as feeding turnips on limited portions of meadow land in order to attract the sheep to those parts and create a sort of open fold. He also used a scarificator or Mr. Chateau Vieux's three coultered plough for opening up meadow after the fold to eradicate moss. He did not believe in folding sheep on turnips. The costs and yields of the experiments in drilling barley wheat, to which Young took slight exception, follow, and these increase in detail in the later volumes. The volume ends with details of communicated experiments, and a review of the weather during the year.

The later reports contain much the same sort of material, but we find in the preface of the third report Baker again anxious to disarm his critics. "It has been insinuated (as I am informed)," he says, "by a Person who has never seen my Farm or my Factory, and consequently can not be a competent judge of what I am doing, or have done; that I have not introduced any Thing that is new." He was nevertheless conscious of the approbation of the real friends of agriculture. He felt that he had been successful in instructing some people in the principles of the Tullian husbandry, which the Society had tried to do ineffectually thirty-six years before. "Envy in one man and haughty malice in another, may endeavor to cast a cloud over what I have done," he said, but he felt the justice of his own position as an armour against their attacks.

Considering Young's remarks about Baker's neglect of the cabbage husbandry, it is a little surprising to find that he claimed, in the report dated 1771, that he was the first to introduce it, and

that it was copied in England from his experiments, although John Randall in his *Semi-Virgilian Husbandry* (London, 1764) recommended the large Scotch cabbage. Baker, however, made the point that he did not expressly say that he had cultivated it, and further to dispose of this unwelcome competitor said, "He is much bewildered, unintelligible, and mistaken in his first principles, as to his general system—And as to what he calls his *Semi-Virgilian Husbandry*, it is a system founded upon the labours of another, whose Genius was too vast for humble imitation, but was made for creating—I mean Mr. Tull, whose Path Mr. Randall seems to have followed . . . yet at a very humble Distance, unworthy of a Man of Mr. Randall's Learning—At the same time there are two or three Ideas in Mr. Randall's work, which are worthy of the highest Praise." This attack is the more curious because he enumerated the elements of a capable system of improved husbandry in the introduction to the abridgment of Young's *Tours*, and in these elements he included "the *cabbage* culture of *Yorkshire*."

The pamphlet *Considerations upon the Exportation of Corn* was read at a meeting of the Dublin Society after it prepared a petition to Parliament to raise the bounty on the exportation of corn and the minimum price when importation of grain was allowed, the idea being to obtain for Ireland some of the benefits which this system was said to have obtained in England. Perhaps the most interesting point about this pamphlet is the argument that in a national sense home-grown produce and home manufactures of home-produced raw material actually cost nothing but the labor put into them, so that if such things are exported the whole price obtained in a foreign country is a profit to the selling country. An account is given in support of this argument, and it must be remembered in criticising it that the mercantile system was devised to ensure a constant favorable balance of trade which meant that a country must always be in receipt of bullion from its customers.

Similar arguments are set forth in his *Practical Agriculture epitomized and adopted to the Tenantry of Ireland* (Dublin, 1771), which was also prepared at the request of the Dublin Society as a

result of some comments he had made, in the introduction to the abridged *Tours*, upon the premium offered by the Society. The book opens with a long exegesis upon the measures recently taken in France to promote agriculture and extend the acreage under crops, and it makes the suggestion that premiums should be offered for cultivating the various soils under three different long courses designed to make the best use of these soils.

There was nothing extraordinary in these courses, he contended, but these suggestions in the course of what he had offered, had led him insensibly, although unavoidably, into an Epitome of Practical Agriculture. "Some," he said, "perhaps will call it by the hateful name of Common husbandry, because I have not embarrassed it with refined principles, and curious machines; but I disclaim the title; the common husbandry in my estimation is a remnant of barbarism and remote ignorance—The three courses of crops I have recommended to your attention, if you please, I shall call Improved Husbandry."

Baker had no opinion of the implements ordinarily used in the country, but was satisfied that he had done something to improve them. He said, "the common plough of Ireland is dreadful, and the harrows are worse—These machines hundreds are possessed of much improved from mine—and I wish some method could be thought of to put them in the hands of every farmer in the Kingdom."

The books ends with a gentle hint. He had intended suggesting he should go to England and to some few other places on behalf of the Society in search of further knowledge, but there was no room to develop the idea in this book, and other reasons were approaching, which rendered it unwise, at least for the present.

In spite of his difficulties in the opposition he experienced from some members of the Society, Baker need not have feared for the reputation of his work. It was appreciated by the judicious amongst his contemporaries, perhaps not without genuine criticism, and it continued to be appreciated after his death. His modern obscurity is the fate of all who devote themselves to assisting the development of what must, of necessity, be a temporary phase in the progress of an industry. Young, who visited

Baker's farm, some time after his death, felt that it was melancholy "to see the land of a man of so much ingenuity no longer his, and more so, to hear with all his exertions he was not able to answer the expectations raised of him. I found what I had expected from reading his experiments, that he wanted capital; without a sufficient one it is impossible to farm well: A man may have all the abilities in the world, write like a genius, talk like an angel, and really understand the business in all its depths, but unless he has a proper capital, his farm will never be fit for exhibition: and then, to condemn him for not being a good farmer in practice as well as theory, is just like abusing the inhabitants of the Irish cabbins for not becoming excellent managers." Baker should have been provided with sufficient capital, although what they did was of great credit to the Society, and instructed not to try experiments, but the exhibition of a farm cultivated in a manner which experience has rendered indisputable in England or elsewhere.[10]

It is indeed true that Baker was sometimes hard put to it to explain the failure of some of his trials. An example was that of the use of M. Chateau Vieux's single cultivator which he made use of in a comparative trial with the horse hoe, with a result of ill-success in horse-hoed wheat. He attributed "the failure of the drilled wheat to the narrowness of the ridges; but they were five feet broad, which is some inches wider than Mr. Tull's, and others since, who had succeeded in this culture."[11]

This instance lends point to Young's further criticism that the Society permitted him "to make and publish small and trifling experiments, objects of curiosity to a private speculatist, but quite unworthy of the Dublin Society;" and that a man supported by such a Society ought rather "to establish what a previous experience has convinced him is right, not to gain his own knowledge at the Society's expense."[12] This criticism is severe and must be read in conjunction with Young's own appre-

[10] Arthur Young, *A Tour in Ireland* (Dublin, 1780), 20–21.

[11] See the article on the "Cultivator" in *The Complete Farmer, or A General Dictionary of Husbandry* (4th ed. London, 1793).

[12] *A Tour in Ireland* (Dublin, 1780), 2: 101.

ciation of Baker and the regard for his work expressed by other people. On his death it was said that "To express the loss in this gentleman in private social life as a husband, a parent, a neighbour and a friend; in a public consideration as one of the first improvers of the agriculture of this Kingdom, history cannot produce,"[13] and John Donaldson writing of the only publication of Baker's he knew, says that the *Experiments* "contain a mass of information on many points of agricultural practice. Clovers and potatoes are largely treated, and turnips rather slightly. Wheat on fallow and clover ley is well discussed. On the whole the contents of this work are of the most enlightened practice and prospect,"[14] and this is perhaps sufficient excuse for my attempt to rescue him from the oblivion of a very brief notice in the *Dictionary of National Biography*.

The following is a bibliography of John Wynn Baker's writings:

(1) *Some Hints for the better improvement of Husbandry.* Dublin, 1762. 8 vo.

(2) *A Plan for instructing youths in Husbandry.* Dublin, 1765. 8 vo.

(3) *Experiments in Agriculture, made under the Direction of the right honourable and honourable Dublin Society, in the year 1765.* And now published at their request. Dublin, 1766. 8 vo. xiii, 87 p. Also volumes dated 1767, 1769, 1771 (2) and 1774; the first volume dated 1765 is not in the British Museum.

(4) *A short Description and List, with the prices of the Instruments of Husbandry, made in the factory at Laughlinstown, . . . in the County of Kildare.* Dublin, 1767. 8 vo. 32 p. (Also 3d ed., 1769. 8 vo. 54 p. Both are bound with the *Experiments* for the year).

(5) *An Abridgment of the 6 weeks and six months' tour's (sic) of Arthur Young, Esq.; through the Southern and Northern Counties of England and part of Wales.*

[13] *Hibernian Magazine*, 5: 566 (September, 1775).
[14] *Agricultural Biography* (London, 1854), no. 119.

Abridged at the request of the Dublin Society. Dublin, 1771. 8 vo. 328 p.

(6) *Considerations upon the exportation of corn; written at the request of the Dublin Society.* Dublin, 1771. 8 vo. 48 p.

(7) *Practical Agriculture epitomized, and adapted to the Tenantry of Ireland, with considerations on the Dublin Society's Premiums for Husbandry, and a plan for an entire change of form therein . . . .* Dublin, 1771. 8 vo. 164 p.

(8) *Reclaiming and Culture of Bog.* Dublin, 1773. 8 vo.

Numbers 1, 2 and 8 are inserted on the authority of W. Frank Perkins, *British and Irish Writers on Agriculture* (Lymington, 1929), whose testimony is supported by Baker himself as to (1) Young as to (1) and (8). The kindness of the Rothamsted Library has enabled me to read (5) and of the Royal Agricultural Society of England Library (7), whose copies seem to be unique in England.

DROUGHT AND AGRICULTURE IN EASTERN SOUTH DAKOTA DURING THE EIGHTEEN NINETIES

HERBERT S. SCHELL

Dakota Territory had been settled primarily by individuals who had migrated from the older states where they had been accustomed to a copious rainfall. Rapid settlement had been made amidst a most propitious supply of moisture which had spelled prosperity to the newly arrived agriculturist during the years from 1879 to 1885. Nearly two-fifths of the entire acreage filed in the public land offices in the year ending July 30, 1883, was in Dakota, in amount nearly twice the area filed on for Minnesota, Nebraska and Kansas combined.[1] So similar were the general farming conditions to those in the eastern states that it became generally assumed that the "rain belt" was gradually marching westward in pace with the westward march of the farmer. A cycle of intensely dry years running its course from 1886 to 1897 not only dispelled this illusion but it confronted the South Dakota farmer with one of the gravest crises in the history of the state.

The eastern portion of the state lies within the 97th and 100th meridians, generally regarded as a belt of demarcation between the arid and moist regions of the United States.[2] It is subjected to a relatively low range of rainfall. The average annual precipitation in this area is about 22 inches.[3] The southeastern communities enjoy a greater amount, ranging from 25 to 30 inches; the northern and western communities have a lower range, re-

[1] Stephen Sargent Visher, *The Geography of South Dakota*, 152 (S. Dak. State Geol. Survey Bul. 8).

[2] A narrative of agricultural development in South Dakota before 1900 naturally restricts itself to the prairie east of the Missouri river. The topography and climatic conditions west of the river set that region fully apart; moreover, in that area, outside the Black Hills, settlements by 1900 were still very sparse.

[3] Visher, 60.

ceiving in some instances only 16 and 17 inches annually.[4] Normally, however, fully 75 per cent of this rainfall occurs during the five growing months.[5] Eastern South Dakota consequently is in a position to utilize to advantage as great an amount of moisture as many of the localities in the humid areas of the east. But frequent interruptions in this seasonal precipitation have in the past presented dire consequences to agricultural activities, for "the variation from year to year as regards seasonal distribution is much greater than the fluctuation in the annual precipitation."[6] A serious deficiency during one or several months may cause a crop failure. These unfavorable conditions are still further intensified by a rapid rate of evaporation, induced by a low relative humidity, high summer temperatures and persistent winds.[7] Evaporation is possibly as important a factor in crop failures as a deficiency of rainfall.

In considering the influence of drought upon the agricultural development of South Dakota a distinction must be drawn between the older settlements that had been made in the extreme southeastern and eastern portions during the 1860's and 1870's, and those made during the "boom period" from 1879 to 1886, for, by the time the serious drought set in, the former communities had already assumed a diversification of farming activities. Moreover, these localities, lying in the more favorable rainfall belt, were not wont to suffer to a like degree. The farmers who during the wet cycle had spread out northward and westward into the central parts were engaged primarily in the cultivation of the small grains, notably wheat, and consequently were likely to suffer more from prolonged droughts than those in the older communities.

The first indication of a diminishing rainfall occurred in the summer of 1885. By 1887 and 1888 the drought became more

[4] *Ibid.*, 61; S. Dak. State Engin. Irrig. *Bien. Rpt.*, 1894, p. 47, in *Public Documents of South Dakota*, 1894.

[5] Alfred Judson Henry, "Rainfall of the Crop Season," in U. S. Dept. Agr. *Yearbook* for 1897, p. 611.

[6] Visher, 65.

[7] *Ibid.*, 60. P. 28 of John P. Finley, "Certain Climatic Changes of the Two Dakotas," in U. S. 52d. Cong., 1st sess., *Senate Exec. Doc.* 157.

intense and assumed a most serious form by 1889.[8] Drought conditions recurred for several years in some portions of the state, although in only one year, namely 1894, did the drought approach the severity of 1889. By 1896 when a relatively rainy season set in, the period of protracted drought may be said to have been broken.[9]

The severe droughts of 1889 and 1894 provoked considerable agitation for drought relief to alleviate suffering among the farmers of the stricken areas. A state committee investigating conditions in 1889 and 1890 estimated the average yield of wheat in some localities at one bushel to the acre.[10] Following the recommendations of Governor Arthur C. Mellette, legislation was enacted in February, 1890, to authorize county commissioners to furnish seed grain to needy farmers.[11] Relief work was organized on a large scale whereby money and supplies were solicited throughout the Northwest.[12] In 1891 the state legislature memorialized Congress to furnish seed grain and feed.[13] State legislation again was passed in February, 1895, empowering county and township officials to furnish seed grain, and many availed themselves of the power granted.[14] Many districts had already taken such action before the legislature had convened.[15] The distress in 1894 was so great that in many counties no efforts were made to enforce the collection of taxes.[16]

While in the throes of these conditions of drought the farmers

[8] S. Dak. State Engin. Irrig. *Ann. Rpt.*, 1892, p. 57.

[9] P. 597 of N. H. Darton, "New Developments in Well Boring and Irrigation in Eastern South Dakota, 1896," in U. S. Geol. Survey Ann. Rpt. 18, part 4, issued as U. S. 55th Cong., 2d sess., *House Doc.*, vol. 18, no. 5; *Press and Dakotan* (Yankton), November 12, 1896.

[10] *Miner County Democrat* (Howard), February 22, 1890.

[11] S. Dak. *House Jour.*, 1890, p. 47; S. Dak. *Sess. Laws*, 1890, ch. 72.

[12] S. Dak. *Sess. Laws*, 1890, ch. 47–48; *Miner County Democrat*, January 11, February 22, 1890. This relief work functioned through state and local committees.

[13] *Sess. Laws*, 1891, p. 260. U. S. 51st Cong., 2d sess. *Congressional Record*, p. 2594, 2658.

[14] *Sess. Laws*, 1895, ch. 167; *Press and Dakotan*, March 23, 27, May 23, 1895.

[15] *Press and Dakotan*, October 12, 25, 1894, February 8, 13, 16, 1895.

[16] *Ibid.*, October 25, 1894.

eagerly turned to the professional rain-maker for assistance. Hope was held out by both quacks and serious-minded scientists that precipitation might be induced through the use of gases and explosives. Through the efforts of Representative J. L. Jolley of South Dakota, Congress was induced to appropriate $10,000 for artificial rain experimentation in South Dakota in 1892. The experiment is said to have taken place at Pierre.[17] Numerous rain-making conventions were held in 1892 in the drought districts. During the summer of 1894 again the rain-maker plied his trade, selling materials and instructions to local committees who vainly bombarded the skies.[18]

A greater degree of attention was directed to irrigation for an artificial source of moisture. Coincident with the general prevalence of drought, in eastern South Dakota within the basin of the James or Dakota river, was revealed the location of a rich belt of artesian waters. This belt, moreover, underlay the area most frequently subjected to the intense droughts. The use of water from this source in sprinkling lawns and gardens led to a popular belief that an extensive system of irrigation might be developed. By 1889 over 100 wells of remarkable pressure and supply were in successful operation in the James river valley.[19] By 1890 experimentation in irrigation with artesian water was under way. A year later water from artesian wells was being applied to about 2000 acres.[20] "If we can't get the moisture from

[17] U. S. 52d. Cong., 1 sess., *Congressional Record*, p. 5153; *Press and Dakotan*, August 25, 1892. Futile experiments in Kansas and Texas had been made under earlier appropriations.

See the report of R. G. Dyrenforth who was in charge of the experimentation, in U. S. 52d Cong., 1 sess., *Senate Exec. Doc.*, vol. 5, no. 45.

[18] The *Press and Dakotan* is replete with such items during January, February, June and August, 1892. In 1894 serious experiments were made at Sioux Falls and Yankton; see the *Press and Dakotan*, June 21, 27, July 10, 30, 1894. The county commissioners of Yankton county paid a professional rain-maker $500 for instructions and materials to "make rain" at a time when the county treasury was running a deficit.

[19] F. H. Hagerty, *The Territory of Dakota . . . An Official Statistical, Historical and Political Abstract* (Aberdeen, 1889), 50. Some of these wells were located where the James river has its source in what became North Dakota.

[20] Progress Report of Special Agent R. J. Hinton, p. 59 in U. S. 51st Cong., 2 sess., *Senate Exec. Doc.*, vol. 1, no. 53. An irrigated tract of 40 acres was reported

above, we will surely have it from below," enthusiastically exclaimed the *Miner County Democrat*.[21] "Irrigate or emigrate," was the alternative offered the drought victim in the current slogan.

Success in irrigation was conditioned by several things. In the first place, little was known of the extent and depth of the Dakota sandstone structure, the main source of the artesian waters. Unless the position and extensiveness of the artesian belt were ascertained, a great outlay of capital in the construction of wells could not be ventured. Secondly, favorable legislation was required that would be conducive to the launching of irrigation projects. In the third place, a certain degree of expertness was requisite for an efficacious application of water for irrigating purposes. Experimentation on a wide scale was necessary to acquire knowledge of proper methods of irrigation.

The attention of the federal government was directed to eastern Dakota in 1889 by a Senate Select Committee on Irrigation. This committee in an itinerary through the Northwest interviewed a number of farmers of Dakota Territory at St. Paul, Sioux Falls, Huron and several points in northern Dakota. The testimony offered, and the implicit faith shown in the feasibility of irrigation made a very favorable impression on the Senators.[22] Lewis McLouth, President of Dakota Agricultural College and Director of the Experiment Station at Brookings, was of the opinion that "A thousand of these wells would easily water this entire valley [James river valley] and convert its area into a most luxuriant garden;" he, moreover, concluded that one or two inches of water applied at the right time, when summer showers failed, would be sufficient to insure certain and abundant crops.[23] The inhabitants of Dakota were particularly anxious to have

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by the U. S. Census of 1890, in its *Agriculture by Irrigation*, 265. Other experiments, undoubtedly, were under way during 1890.

[21] *Miner County Democrat*, April 19, 1890.

[22] The record of the interviews, together with the recommendations of the Select Committee, appear in U. S. 51st Cong., 1 sess., *Senate Rpt.*, vol. 5, no. 928, parts 1 and 2. Statehood, with a division of the Dakotas, was not consummated until November 2, 1889.

[23] *Ibid.*, part 2, p. 79.

the national government provide a commission for a geological and hydrographic survey of the artesian basin.[24]

In response to the urgent requests of the Dakotas, as well as those of other western states and territories, Congress provided for appropriations in 1890 "to investigate the proper location for artesian wells and their use in irrigation in the semi-arid regions between the ninety-seventy degree of west longitude . . . and the eastern foothills of the Rocky Mountains."[25] The investigation was entrusted to the Department of Agriculture which created the Office of Irrigation Inquiry. This work was launched in 1890, consisting mainly of experimentations in the artesian belt of South Dakota under the supervision of irrigation engineers and skilled irrigators.[26] Those interested in the projects furnished the land and seed employed in the experiments and assumed the cost of constructing ditches. The United States Geological Survey, likewise, undertook to investigate the character of the artesian belt.[27]

Legislation respecting the construction of artesian wells had been enacted by the territorial legislature in 1887 and 1889.[28] It was not, however, until the first legislature of the newly-formed state convened in 1890, that the irrigation movement received specific legislative recognition. In that year two significant enactments were passed. One measure defined the rights and liabilities of persons and corporations constructing artesian wells for purposes of power and irrigation; the other provided for a state Engineer of Irrigation whose duty it was to take charge of the development of a system of irrigation, to cooperate with the

[24] The Select Committee was memorialized to this effect by the constitutional conventions of both South and North Dakota. See *ibid.*, 67, 122, 123.

[25] "Report of the Secretary of Agriculture, 1890," in U. S. 51st Cong., 2 sess., *House Exec. Doc.*, vol. 17, p. 39.

[26] Report of Special Agent R. J. Hinton, *op. cit.*, 480–483; *Miner County Democrat*, May 24, 1890, June 6, 1891.

[27] A comprehensive description of the artesian basin, together with a summary of irrigation projects in 1896, compiled by N. H. Darton and entitled "A Preliminary Report on Artesian Waters of a Portion of the Dakotas" is included as No. 5 in U. S. Geol. Survey Ann. Rpt. 17, part 2, in U. S. 54th Cong., 2 sess., *House Doc.*, vol. 16.

[28] *Session Laws of Dakota Territory*, 1887, ch. 7; 1889, ch. 14.

national government in irrigation surveys, to establish experimental stations and to further, in general, the sinking of artesian wells for irrigation purposes.[29] In 1891 the so-called Melville law was passed, authorizing civil townships to sink artesian wells following a public election on the question of issuing bonds for such purpose.[30] Similar authority was vested in the county jurisdictions in 1893.[31] The limit of public indebtedness was extended by an amendment to the state constitution in 1896 to ten per cent of the assessed value of taxable property for the purpose of providing water for irrigation and domestic use.[32]

This legislation reflected a popular interest in irrigation that had become widespread in the early 1890's. Numerous local assemblages had imbued the movement with considerable vitality. Frequent state conventions were called to map out a program that would serve to further the cause of irrigation, and much lobbying was resorted to by them. A citizens' state board was created in 1890 to lend assistance to the State Engineer.[33] The irrigation theme engendered resolutions at most of the political conventions from 1890 to 1894.[34] The *Dakota Farmer*, a journal published at Huron, began an "irrigation department" in 1890, which reported the experiences of the various irrigation projects. The state press not only recorded the items of interest but featured special articles on irrigation. The Sioux Falls *Argus Leader*

[29] *Session Laws*, 1890, ch. 103, 104. F.F.B. Coffin, who was appointed state engineer in 1890, also received an appointment from the national government, making him a member of the federal commission described above. See the *Miner County Democrat*, November 29, 1890.

[30] *Session Laws*, 1891, ch. 80. This law was sponsored by State Senator A. B. Melville of Huron, an irrigation enthusiast who had been discussing the question widely throughout the state in 1891. See the *Miner County Democrat*, June 6, 1891.

[31] *Session Laws*, 1893, ch. 109.

[32] *Ibid.*, 1897, xliii. The amendment was adopted by a two to one vote.

[33] Progress report of special agent Hinton, issued as U. S. 51st Cong., 2 sess., *Senate Exec. Doc.*, no. 53.

[34] *Miner County Democrat*, September 6, 1890, October 10, 1891, August 3, 1892; *Press and Dakotan*, September 7, 1894. The Democrats in their state convention at Huron in 1891 demanded that the federal government return 25 per cent of the funds accruing from the sale of public lands within its border to the state for use in developing a system of irrigation.

in 1891 in an editorial, "The Great Question," referring to the moisture problem, optimistically stated, "The inducing of widespread immigration, the investment of capital, the construction and enlargement of railroads, the building of cities, the increasing of marketing facilities, the lowering of individual taxes and the vast increase in the wealth of the state depend upon this solution;" it, accordingly, announced, the early publication of a series of articles in the hope "to arouse sufficient interest . . . to secure the perfection and operation of some plant by which the fertile Jim and Missouri valleys will be converted into the richest lands on the continent."[35] Railroads and real estate "boomers" operating in the artesian belt, likewise, displayed intense interest.

The irrigation movement was well under way by 1892. The experimentations during 1890 and 1891 had indicated crop yields far in excess of those obtained from non-irrigated fields. Wheat under irrigation was said to yield from 15 to 25 bushels more to the acre, a yield of 53 bushels being reported in one instance.[36]

A serious obstacle appeared in the relatively high cost of well construction. Individual farmers found themselves unable to finance the sinking of deep wells which alone could furnish a flow adequate for irrigation. An outlay of from $3000 to $5000 was entailed in the construction of deep wells.[37] In an effort to assist in the reduction of this well-nigh prohibitive item, the Chicago and Northwestern and Chicago, Milwaukee and St. Paul railways transported pipes and well machinery without charge in 1890 and 1891.[38] In several instances, counties purchased well machinery to be loaned to farmers who undertook to sink wells. This plan generally proved disastrous to the county.[39] Under

[35] *Miner County Democrat*, January 24, 1891 (exchange item).

[36] S. Dak. State Engin. Irrig. Ann. Rpt., 1892, p. 59.

[37] *Ibid.*, 69; Off. Expt. Stas. Rpt. 1903, p. 481, in U. S. 58th Cong., 2 sess., *Senate Doc.*, vol. 13, no. 148.

[38] S. Dak. State Engin. Irrig., *Ann. Rpt.*, 1892, p. 70; *Miner County Democrat*, March 14, 1891. In 1891, however, the Chicago and Northwestern Railroad merely made a reduction in rates. It was claimed that these services of the railways reduced the cost of each well from $50 to $300.

[39] Engin. Rpt., *op. cit.* Douglas County purchased two well drilling outfits in 1890; see the *Miner County Democrat*, Dec. 20, 1890. Three outfits, purchased by Brule

the circumstances, irrigation wells were located mainly by associations and civil districts. Wells were sunk in Brule, Beadle, Douglas, Jerauld, Sanborn and Spink counties under the laws enacted in 1891 and 1893.[40] By 1897, Brule county had issued about $90,000 in warrants for sinking irrigation wells; the county paid 10 per cent of this, collecting 25 per cent from the townships and 65 per cent from the property owners benefited.[41] By the end of the decade, improvements in well boring had materially reduced the cost of construction.[42]

By 1896, which marks the zenith of the irrigation movement, nearly a hundred farms were irrigated, besides many gardens and several trial areas.[43] These were located, in general, in a line from Aberdeen south to Mitchell and thence west to Chamberlain. Progress in irrigation was slow because skill and experience had to be acquired. Many farmers and associations employed expert irrigators. Captain C. S. Fassett, who served most energetically as State Engineer of Irrigation during 1893 and 1894, was an irrigation expert.[44] Following the agitation for artesian wells, attention became focused on practical methods of irrigating the land. The conventions held at frequent intervals were headed by practical irrigationists. The State Agricultural College which had leased a tract of land for experimentation at Mellette in Spink county in 1891 published the following year an instructive pamphlet on methods of distribution and application

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County at a cost of $850 each, proved to be worthless for drilling purposes; see *ibid.*, February 21, May 23, 1891.

[40] *Press and Dakotan*, November 25, 1893, February 15, August 10, 1894, February 27, April 29, August 2, October 22, 1895, January 31, 1896.

[41] *Ibid.*, January 19, 1897. Practically no crops had been raised in Brule County in 1895 without the assistance of irrigation; see Darton, *A Preliminary Report on Artesian Waters . . . .*, 686.

[42] The apparatus was made more durable and portable and could be operated more economically; see the *Press and Dakotan*, April 24, 1896. In 1899 the gasoline well drilling outfit of Peter Norbeck, later Governor and United States Senator, was reported to have broken all records by finishing a well of nearly 800 feet within four days; see *ibid.*, October 31, 1899.

[43] Darton, *loc. cit.*, 681.

[44] *Press and Dakotan*, January 23, 26, 1893. Fassett, prior to his appointment, had managed an irrigated farm at Hitchcock. He had become an irrigation expert in Nevada where he had resided earlier.

of water and other pertinent facts about irrigation.[45] Reduced rates were granted by the railroads to encourage farmers to visit the widely advertised irrigated farm of Harry F. Hunter at Mellette (where the sub-experiment station was located).[46]

As rainy seasons became more prevalent, interest in irrigation began to lag.[47] "We have passed from the drought period and have entered an era of old time moisture supply. We will now stop talking about irrigation," was the comment of the editor of the *Press and Dakotan*.[48] A number of other factors were contributory to the decline in interest. Few of the deep wells had proved financially profitable; the benefits derived were said to have been generally insufficient to pay the interest on the cost of the wells.[49] The townships that had undertaken to sink artesian wells were frequently forced to abandon the projects through an inability to sell the well bonds.[50] Some of the wells began to decline through a diminution of pressure, faulty construction or because of stoppage by sand.[51] Farmers who made use of artesian water usually knew very little about irrigation, often flooding fields excessively or applying water that was too cold. In many instances, where artesian water was applied, the soil became covered with mineral matter that proved injurious to crops after the first season.[52] Another factor that contributed to

[45] *Press and Dakotan*, April 11, 1892. An "Irrigation Manual" by W. P. Butler of Huron appeared at about the same time. See S. Dak. Commr. Labor Statis., Rpt., 1894, p. 88.

[46] *Press and Dakotan*, July 2, 1895. Hunter who served as immigration agent for the Chicago, Milwaukee and St. Paul Railroad in the state displayed from time to time a car load of products from his irrigated farm. See *ibid.*, July 13, October 13, 1895.

[47] Darton, "New Developments in Well Boring and Irrigation in Eastern South Dakota, 1896," p. 567, in U. S. Geol. Survey, part 4, printed as U. S. 55th Cong., 2 sess., *House Doc.*, vol. 18.

[48] Issue of November 12, 1896.

[49] U. S. Dept. Agr. Off. Expt. Stas. Rpt. 1903, p. 481–482.

[50] *Press and Dakotan*, November 13, 1895. See S. Dak. State Engin. Irrig. Rpt. 1892, p. 44, for the difficulties of townships in financing well projects.

[51] See p. 31 of J. E. Todd, "Geology and Water Resources of a Portion of South eastern South Dakota," in U. S. 56th Cong., 1 sess., *House Doc.*, vol. 73, no. 663.

[52] Darton, *A Preliminary Report*, 681; U. S. Bur. Census, Twelfth Census of the United States, 1900, Agriculture, part 2, p. 872; U. S. Dept. Agr. Off. Expt. Stas. Rpt. 1903, p. 482.

the impracticality of irrigation was the rolling topography of the artesian belt. In only a small portion within the James river valley is the topography favorable to intensive irrigation. Moreover, the construction of a system of ditches and reservoirs was such an item of expense that many farmers were deterred from launching projects.[53]

About 5000 acres were under irrigation in the eastern part of the state in 1900, representing apparently 123 farms and gardens. Fifteen of these were located in Spink county.[54] Most of this acreage by this time was being irrigated by means of small shallow wells that did not require an extensive system of ditches and reservoirs.[55]

The state legislature in 1897 took cognizance of the waning interest in irrigation east of the Missouri when it abolished the office of State Engineer of Irrigation, transferring the duties of that official to an instructor in the Agricultural College at Brookings.[56] At the same time, a sub-experiment station was created at Highmore, Hyde county, "for the purpose of carrying on experiments with drought resisting forage plants suitable for the dry range regions of middle South Dakota."[57] No irrigation was to be employed. The Engineer of Irrigation reported in 1902 that practically all interest in the subject of irrigation had ceased.[58] The Experiment Station at the Agricultural College published from time to time the results of its experimentation with forage and garden crops grown under irrigation in the James river valley, but its emphasis was being shifted towards experiments on the renovation of native pastures and the culture of grasses and forage plants without irrigation.[59] Special attention was paid to hardy grasses, specimens of which had been intro-

[53] Visher, 18.

[54] U. S. Bur. Census, *op. cit.*

[55] U. S. Dept. Agr. Off. Expt. Stas. Rpt. 1903, p. 482.

[56] *Session Laws*, 1897, ch. 73.

[57] *Ibid.*, ch. 8.

[58] S. Dak. State Engin. Irrig. Rpt., 1902, p. 5.

[59] Report of the Secretary of Agriculture, 1899, p. 84, in U. S. 56th Cong., 1 sess., *House Doc.*, vol. 32. Bulletins 59 and 61 of the publications of the Experiment Station at Brookings presented the results of the experimentation in irrigation in 1897 and 1898.

duced from Manitoba and Siberia.[60] A new chapter was being started in the process of conquering the "semi-arid" region of central South Dakota, but in the direction of dry land farming.

Real estate "boomers" and speculators had, undoubtedly, furnished much of the driving force behind the irrigation movement. From November, 1889, to July, 1892, fifteen domestic and two out-of-state corporations were organized to engage in irrigation east of the Missouri.[61] Each of these land companies was incorporated at a capitalization ranging from $2000 to $5,000,000; only six were capitalized at less than $100,000. The best known of these was probably the Consolidated Land and Irrigation Company of Huron, capitalized in 1890 at $5,000,000.[62] The capital that was actually invested in these corporations seems to have been generally supplied by eastern investors. The *Huronite* stated in 1890 that the New York Irrigation Company through its Huron office had secured title to between fifty and sixty quarter sections of land and was negotiating for more.[63] Mortgage loans on irrigated lands were reported to have been especially inviting to investors.[64] Loan companies who had found in their possessions vast areas as a result of foreclosures during the hard times of the early nineties were eagerly turning to artesian wells as a means of making their holdings marketable.[65]

The irrigation movement, despite its wide publicity, never received the full support of the South Dakotans. Skeptics were continually doubting the practicality of irrigation. The wisdom of increasing the production of wheat under an expensive system

[60] *Press and Dakotan*, May 1, 1899.

[61] S. Dak. State Secretary of State Rpt. 1892, p. 16–34; 1896, p. 62–67. All but four of the domestic corporations were organized in 1890 and 1891.

[62] This company had issued a pamphlet in 1891 in the interest of irrigation farming; see the *Press and Dakotan*, January 8, 1892. Its success in irrigating crops was widely reported.

[63] *Miner County Democrat*, February 21, 1891 (exchange item). St. Paul, Chicago, Buffalo, Philadelphia, New York and Boston capitalists are mentioned in connection with this phase of the irrigation movement in the *Miner County Democrat* in 1890 and 1891 and the *Press and Dakotan* from 1892 to 1897.

[64] *Press and Dakotan*, December 29, 1896.

[65] *Ibid.*, October 11, 14, 1895, December 1, 1896.

of culture when it was selling at forty cents was questioned.[66] Chief opposition, however, was voiced in the fear that the movement might give the state an unsavory reputation. The farmers within the artesian belt who had been faring well without the aid of irrigation through diversified farming, and those in the older communities where crop failures were less common, resented the unfavorable advertising the state was receiving. The Parkston *Advance* declared that, ". . . the 'irrigation' papers in the state are doing more harm to this country than all the blizzards, mortgages and corrupt politicians ever did."[67] Real estate men were insisting that homeseekers from the east were deterred from coming to South Dakota because of the alleged necessity of irrigation.[68]

Crop diversification, rather than irrigation, was the chief means utilized for improving farming conditions during this decade. As indicated before, the older counties in the southeastern portions had turned to mixed farming at an earlier date,[69] but the area settled primarily after 1880 was still in 1890 relying mainly on wheat as the money crop. This was especially true of the artesian belt and the counties westward to the Missouri river. Under the twofold handicap of drought and the relatively low price of wheat, a distinct trend towards diversification set in.[70]

The readjustments and trends in agriculture can be best shown for purposes of this study by dividing the area east of the Missouri river into two sections. Eighteen counties extending

[66] Number one grade generally commanded that price during this period. Under the adverse weather conditions, however, this grade was more or less uncommon. Number two grade commanded thirty-two cents at Huron in August, 1896; no wheat of number one grade had reached the elevators there for several years. See the *Press and Dakotan*, August 29, 1896.

[67] *Ibid.*, April 23, 1894 (exchange item).

[68] *Ibid.*, February 1, 1894.

[69] See Harold E. Briggs, "The Development of Agriculture in Territorial Dakota," in *The Culver-Stockton Quarterly*, 7: 1–38 (January, 1931).

[70] In reply to 170 questionnaires submitted to farmers in 1894 by the Commissioner of Labor Statistics, 44 suggested mixed farming as the best means of improving farming conditions; 25 suggested irrigation and 12 improved methods of cultivation and seeding. See the S. Dak. Commr. Labor Statis. *Bien Rpt.*, 1894, p. 24–32.

eastward from the river and including the tier of counties from Aberdeen to Woonsocket and thence west to Chamberlain may be conveniently regarded as constituting Group A. The serious efforts at irrigation were made in the eastern and southern portions and, in general, this group suffered most from the protracted droughts of the period.[71] Here the most radical agricultural changes occurred. The remaining twenty-six counties will be termed Group B.

These groups are further differentiated by the valuation of farm products within their respective areas. The products of the first group represented a valuation of from $100 to $1000 per square mile; in the eastern tier of counties only was the valuation higher. The products of the second group had a valuation ranging from $1000 to $5000 per square mile.[72]

The following data indicate the rate of progress of agricultural development within the two respective groups of counties in eastern South Dakota during 1890–1900, expressed in terms of percentage of increase: *Group A*—population, 8 (decrease); improved farm acreage, 51.5; number of farms, 27 (decrease); wheat acreage, 23.8; corn acreage, 3; number of neat cattle, 141; number of sheep, 239; *Group B*—population, 29; improved farm acreage, 68.8; number of farms, 15; wheat acreage, 124; corn acreage, 85; number of neat cattle, 49; number of sheep, 70.[73]

Wheat production lagged within the first group. In 1890 these counties had reported an aggregate acreage of more than one million, being surpassed by the counties in Group B by only ninety thousand acres. By 1900, the acreage in six counties had actually declined and in only six had it increased to an appreciable degree. Within Group B, on the other hand, the acreage increased from 1,169,165 to 2,623,140. The extremely low yields in the counties frequented by droughts, together with the pre-

[71] The following counties constitute Group A: Aurora, Beadle, Brown, Brule, Buffalo, Campbell, Edmunds, Faulk, Hand, Hughes, Hyde, Jerauld, McPherson, Potter, Sanborn, Spink, Sully, and Walworth.

[72] U. S. Bur. Census, Eleventh Census of the United States, 1890, vol. 9, Agriculture, plate 3; Twelfth Census of the United States, 1900, vol. 5, Agriculture, part 1, plate 4.

[73] Computations from the U. S. Bureau of the Census reports for 1890 and 1900.

vailing low prices, had been spelling disaster to the farmer. Less reliance was consequently being placed on wheat as the leading money crop in the counties comprising Group A.[74]

Considerable attention was directed toward an improvement in the methods of farming wheat. Wheat yields varying from ten to twenty-four bushels within the same locality reflected differences in modes of cultivation, rather than differences in quality of soil. In many of the newer counties, wheat was frequently planted by discing or by deep drilling in the stubble. Fields often were not plowed for half a dozen years. In dry seasons, the yield was inevitably low under such methods of tillage.[75] More thorough tillage and better seeding became generally recognized as crying needs. The Northwestern Elevator Company of Minneapolis circularized wheat farmers in 1896 with suggestions about drilling in wheat to prevent drying out while the grain was maturing.[76] In order to improve the quality of Dakota wheat, elevator companies were also urging farmers to obtain pure seed. The grain from the South Dakota fields was said to have deteriorated from the practice of seeding on the same ground year after year.[77] Much misfortune, it was claimed, had been befalling the wheat farmers because of their failure to change seed wheat.

The main change within Group A during this period was the shift from wheat to stock raising. The number of neat cattle in this area increased from 179,888 in 1890 to 433,504 in 1900, representing an increase of 141 per cent. On the rolling prairie in the central section adjoining the Missouri river stock raising became predominant. The number of cattle in Hand, Hyde, Hughes and Sully counties increased from 34,529 to 110,009 during the decade.[78] Highmore, in Hyde county, became a great shipping center, averaging a carload a day during the shipping

[74] Campbell, McPherson, Potter, Sanborn, Spink and Walworth counties increased their wheat acreage considerably and may be considered exceptions to this statement. These counties, however, logically belong to Group A because, in other respects, they show developments similar to the other counties in the group.

[75] *Press and Dakotan*, August 27, 1896.

[76] *Ibid.*, March 14, 1896.

[77] *Ibid.*, December 17, 1897, March 21, 1899.

[78] The wheat acreage for these counties decreased from 92,019 to 86,881.

seasons by 1895 whereas in 1890 not a single carload had been shipped from this point.[79] The range was relatively free and unfenced and efforts were made to modify the Herd Law to permit livestock to run at large during the winter months.[80] In some counties only enough grain was grown to furnish feed. Artesian wells proved a great asset in furnishing an unfailing supply for stock watering.

The advance in sheep raising was even more marked than that in the cattle industry. The number of sheep for Group A increased from 79,815 to 270,876, an increase of 239 per cent. A state Sheep Breeders and Wool Growers Association had been organized before 1890, and interest was fostered locally through county organizations.[81] The open winters, absence of snow and rain, and the rough rolling character of the land made the sheep industry a successful pursuit. "With all the talk of drouth, Beadle county has not seen a year yet in which wool-raising was not a success," commented the *Huronite* in 1891.[82] Sheep inspection laws were enacted in 1891 and 1897.[83]

In the counties comprising Group B, the combination of grain and stock farming was continued during the period. The main new development to be noted here is the appearance of the dairy industry, which was shared to some extent by the counties in Group A, especially those in the James river valley. While in 1890 only 16 establishments manufacturing dairy products were located in the state, a decade later 138 cheese, butter and condensed milk factories were reported.[84] The majority of the creameries were operated by cooperative associations. There

[79] *Press and Dakotan*, September 26, 1895, January 9, 1896.

[80] *Ibid.*, September 19, November 7, 1895. A bill introduced in the legislature in 1895 by the representative from Hyde and Sully counties had been reported favorably but was never voted on. See the South Dakota *House Jour.*, 1895, p. 837, 1071.

[81] *Miner County Democrat*, February 14, 21, May 2, 1891.

[82] *Ibid.*, February 21, 1891 (exchange item).

[83] *Sess. Laws*, 1891, ch. 107; 1897, ch. 91.

[84] U. S. Bur. Census, Eleventh Census of the United States, 1890, Compendium, part 3, p. 836; Twelfth Census of the United States, 1900, vol. 8, Manufacturing, part 2, p. 842. The aggregate capitalization of these establishments rose from $34,000 to $461,000.

were 157 creamery associations incorporated from 1891 to 1899, with the greatest activity shown in 1896 when 51 companies were chartered.[85] South Dakota butter was widely advertised and the state became recognized as one of the leading dairy states. Sioux Falls was the meeting place for the National Buttermakers Convention in January, 1899, and the entries from South Dakota compared favorably with out-of-state entries.[86] The state legislature, then in session, showed its interest by adjourning for several days in order to attend the convention. Public interest in dairying was stimulated by dairy conventions, and dairy programs at Farmers' Institutes. The State Agricultural College had instituted courses in dairying as early as 1891. In 1901 the legislature undertook the regulation of creameries by requiring licenses of creamery corporations and providing for a Food and Dairy Commissioner.[87]

Persistent efforts were made throughout entire eastern South Dakota during this period to produce sugar beets. This interest in sugar beet culture was nation wide and was actively stimulated by the United States Department of Agriculture. Prospects in South Dakota were said to be especially bright, "as the industry is particularly adapted to a country where the land is not wet."[88] In the endeavor to draw capital into the state by way of beet sugar factories, the legislature in 1890 provided for a bounty of one cent for every pound of sugar produced from South Dakota beets.[89] Considerable experimentation was made throughout the entire period under the direction of the State Agricultural College, and some attempts were made to grow beets under irrigation. A very high sugar content was found in the beets grown. Committees were formed and mass meetings held in many localities to induce farmers to undertake the cultivation of a sufficient

[85] Statistics from the S. Dak. State Sec. State Bien. Rpt., 1892, 1894, 1896, 1898, and 1900.

[86] *Press and Dakotan*, January 24, 1899.

[87] *Session Laws*, 1901, ch. 131.

[88] *Miner County Democrat*, May 3, 1890. The Department of Agriculture, however, claimed that the low winter temperature was not as favorable to stored beets; see Report of Secretary of Agriculture, 1890, p. 173.

[89] *Session Laws*, 1890, ch. 146.

acreage to make it worthwhile for sugar factories to be established.[90] A new bounty measure passed the legislature in 1899 but failed to secure the approval of Governor Andrew E. Lee.[91] Despite all this interest in the fostering of the sugar beet industry, nothing concrete was realized.

The movement towards diversification in the counties of Group A was accompanied by a very pronounced change in the size of farm holdings. In 1900 the average size of farms in these counties ranged from 400 to 700 acres.[92] In twelve the acreage per farm had doubled since 1890. In marked contrast with this change, in the counties comprising Group B the average size had increased but slightly by 1900; in not a single county did the average size attain 400 acres. The aggregate farm acreage for the two groups, however, showed but slight divergence. For Group A the improved farm acreage had increased slightly over 50 per cent; that for Group B showed an increase of 68.

The decline of population in Group A during the 1890's was unquestionably the result of protracted droughts. The federal census for 1900 indicated a decrease of 8 per cent. Only six counties within the group showed an increase.[93] Every county within Group B, on the other hand, increased in population during the decade. The movement of decline during the drought period is revealed even more definitely by a comparison with the state census taken in 1895. According to the figures tabulated in that year by the county assessors, Group A had suffered a loss of 16 per cent since 1890, whereas Group B had actually increased nearly 9 per cent.[94]

[90] According to the files of the *Miner County Democrat* for 1890 and the *Press and Dakotan* from 1892 to 1897, such activities appeared in Aberdeen, Brookings, Huron, Sioux Falls, Vermillion, Volin, Watertown, Wolsey and Yankton.

[91] S. Dak. *Senate Jour.* 1899, p. 1153, 1539.

[92] In Hyde county the average size was slightly below 400; in Sully it was 978 acres. The average size in the counties within Group A in 1890 ranged from 211 to 284 acres.

[93] These were Campbell, Edmunds, McPherson, Potter, Walworth and Buffalo. The first five counties are located in the angle formed by the northern boundary line and the Missouri river and were relatively unsettled at this time.

[94] Census figures for 1895 from *Press and Dakotan*, November 15, 1895. The census figures were as follows: Group A, 1890, 96, 848; 1895, 81, 266; 1900, 88, 878; for Group B, the figures for the three dates were 195, 624, 212, 779, and 252, 867.

The crisis confronting agriculture in eastern South Dakota during the period from 1890 to 1900 was provocative of definite results. Efforts to obtain moisture through artificial means had proved impractical and illusory. The area most seriously affected by droughts underwent a rapid diversification in the direction of stock farming. Grain farming in this area decreased in importance. A decline in population and a decrease in the number of farms gave irrefutable witness to the change. Many farms were abandoned. Larger sized farms emerged to fit the needs of stock farming. In the regions less seriously affected by the droughts, agriculturists increased in number, farms increased but slightly in size, and mixed farming continued with little variation.

NEWS NOTES AND COMMENTS

HISTORICAL PAGEANT

A pageant portraying the evolution and development of grain harvesting machinery from the primitive to modern stages, given as part of the program of the twenty-fifth anniversary meeting of the American Society of Agricultural Engineers at Ames, Iowa, on June 24, 1931, had two objectives, namely the depicting of the development and benefits resulting from the application of engineering to agriculture's great grain harvesting problem, and the honoring of Cyrus Hall McCormick for his part in a century of progress. An "event" in the pageant was devoted to each of the following: the sickle; the scythe; the cradle or cradle scythe; McCormick's first reaper; McCormick's improved reaper; the self rake reaper; the Marsh harvester; the wire binder; the twine binder; the modern horse-drawn binder; the tractor-drawn power take-off driven binder; the horse-drawn ground-drive combined harvester-thresher; the modern tractor-drawn combine harvester-thresher with auxiliary engine to drive reaping and threshing mechanism; the modern horse-drawn combine harvester-thresher with auxiliary engine to drive reaping and threshing mechanism; windrowers; the "combine" with pick-up attachment; and "the march of progress (increased capacity)." For the significance of this particular meeting of the Society, see the editorial in the *Experiment Station Record*, 65: 401–405 (October, 1931), entitled "The Quarter Centennial of the American Society of Agricultural Engineers."

URUSVATI HIMALAYAN RESEARCH INSTITUTE OF THE ROERICH MUSEUM

The Himalayan Research Institute, founded by the Roerich Museum of New York City, proposes to conduct original scientific research in varied fields of arts and sciences. The Research

Institute consists of the following research departments: archaeology, related sciences and arts; natural sciences and applied research; the research library; and the museum. One of the main objects of the Institute is to preserve and record the rapidly vanishing folklore knowledge, and to provide American and European scholars with a possibility of field-work in India and other regions of the Middle East. The initial number of volume one of the *Journal of Urusvati Himalayan Research Institute* was issued in July, 1931.

GEORGE WASHINGTON AND AGRICULTURE

On the occasion of the bicentenary of George Washington's birth, a number of publications of interest to readers of *Agricultural History* have appeared. Among these is a mimeographed circular, *George Washington and Agriculture; A Classified List of Annotated References with an Introductory Note* (Washington, D. C., 1931. vi, 25 p.), by Everett E. Edwards and issued by the United States Department of Agriculture Library as its *Bibliographical Contributions No. 22*. Copies may be obtained by addressing either the compiler or the Library.

Two of the pamphlets of the Honor to George Washington Series edited by Albert Bushnell Hart, and published by the George Washington Bicentennial Commission are also of interest. These are David M. Matteson's *Washington the Farmer* (Washington, 1931. 31 p., illus.) and James Hosmer Penniman's *Washington, Proprietor of Mount Vernon* (Washington, 1931. 40 p., illus.). Copies of these pamphlets and similar material may be secured by addressing the George Washington Bicentennial Commission, Washington Bldg., Washington, D. C.

ACTIVITIES OF THE BUSINESS HISTORICAL SOCIETY

Readers of *Agricultural History* will be interested in the activities of the Business Historical Society, organized in 1925. Impressed by the wanton destruction of out-of-date business records and the necessity for saving them if present-day and future business development are to be served intelligently, the incorporators formed the Society especially to preserve historical

business data. A contract executed with the Harvard Graduate School of Business Administration provides permanent housing facilities for the collections of the Society in the new George F. Baker Library, as well as the services of a highly trained personnel necessary to make these data available for research. A solid foundation for a structure of exceptional scope is thus assured.

The Business Historical Society is searching for the records of early business activities in all parts of the world—the account books, letters, articles of partnership, indentures, journals and diaries of the men and business organizations who have laid the foundations for our present commercial system. The purpose of the Society, however, is not to obtain a monopoly of existing historical data, but to stimulate their collection and preservation wherever adequate housing and cataloguing facilities may be available and, failing these resources, to offer the services of the George F. Baker Library for the purpose. With reference to the history of business conditions in the United States, the records of the farmer, the small manufacturer and the country store-keeper as fundamental records are being emphasized. It is obvious that research workers in agricultural history will find much of interest to them in this clearing house of historical business information.

As yet the number of farmers' account books in the possession of the Society is small and entirely inadequate. Those from Massachusetts are as follows: an account book kept by John Nelson of Middleboro for the years 1788–1803; two by Nahum Fay of Northboro for 1788–1832; one by Aaron Cook of Harvard for 1794–1833; one by Nehemiah Haley of Winchester for 1811–1835; one by William Moseley of Westfield for 1812–1825; and one by William H. Odiorne of Billerica for 1845–1856. The Society also has the account book of Calvin Fullerton of Fayston, Vermont, covering the years 1831–1842.

The Society is more fortunate in the possession of records of general stores. This material embraces some twenty collections of account books of from one to fifty volumes each. As in the

case of farmers' accounts, these records have considerable information on the range of prices at the time of their compilation.

The Business Historical Society hopes that those who have any records similar to those here referred to will aid research by depositing them with, or giving them to, its collections. The Society offers to pay all package and transportation charges and assures the present owner of a safe storage place for these records. The material will be carefully collated and catalogued, and thus made available for research and study.

BOOKS

Letters from Fraternity (New York, E. P. Dutton & Co., 1931. 251 p.) by A. L. McCorrison, a farmer in a New Hampshire town fictitiously called Fraternity, written to Ben Ames Williams during the years since 1918, give a picture of New England rural life that is fast fading into the background of history. The volume is reviewed by Rose C. Feld in the *New York Times Book Review*, July 5, 1931, p. 10.

William T. Hutchinson's *Cyrus Hall McCormick; Seed Time, 1809–1856* (New York and London, Century Co., 1930. 493 p.) is the result of three years of exhaustive study of the inventor of the reaper. The volume is reviewed by James Alton James in the *Mississippi Valley Historical Review*, 17: 630–631 (March, 1931); by Elbert J. Benton in the *American Historical Review*, 36: 835–836 (July, 1931); and by O. C. Stine in *Agricultural Economics Literature* for October, 1931.

The Century of the Reaper; An Account of Cyrus Hall McCormick, the Inventor of the Reaper: of the McCormick Harvesting Machine Company, the Business he created: and of the International Harvestor Company, his Heir and Chief Memorial (New York, Houghton Mifflin Co., 1931. 307 p.), by Cyrus McCormick, is reviewed by James Alton James in the *Mississippi Valley Historical Review*, 18: 270–271 (September, 1931).

The Introduction of Farm Machinery in its Relation to the Productivity of Labor in the Agriculture of the United States during the

Nineteenth Century (Berkeley, Calif., Univ. Calif. Press, 1931. 260 p.), by Leo Rogin, has been issued as a volume 9 of the University of California Publications in Economics.

In response to the "need for some collected information concerning the work and accomplishments of the South Carolina Experiment Station" G. H. Aull has written a pamphlet entitled "The South Carolina Agricultural Experiment Station; A Brief History, 1887–1930" which has been issued as the Station's *Circular 44*. See also the editorial entitled "A Brief History of the South Carolina Experiment Station," in the *Experiment Station Record*, 65: 405–406 (October, 1931).

Connecticut Agricultural College—A History (Storrs, Conn., 1931. 258 p., illus.) has been written by Walter Stemmons, the research having been done in collaboration with André Schenker.

Frederic Bancroft's *Slave-Trading in the Old South* (Baltimore, J. H. Furst Co., 1931. 415 p., illus.) is reviewed by Arthur C. Cole in the *Mississippi Valley Historical Review*, 18: 257–259 (September, 1931).

In *The Great Plains* (Boston, Ginn & Co., 1931. 325 p., illus., maps), Walter Prescott Webb makes a historical survey of a single environmental unit. Beginning with a geological study of the Plains region, he then discusses the vegetation, the animal life, and the native Indian culture. His central theme, however, is the way the settlers from 1850 onward conquered the region in spite of its lack of water and timber. The book is reviewed by Rupert N. Richardson in the *Southwestern Historical Quarterly*, 35: 169–172 (October, 1931).

In *The Populist Revolt: A History of the Farmers' Alliance and the People's Party* (Minneapolis, Univ. of Minn. Press, 1931. 473 p., illus., maps) John D. Hicks, after surveying economic conditions in the South and West following the Civil War, traces the growth of third-party activity from the deflation of the great

boom in the late eighties through the period of depression and attendant political agitation that lasted until the campaign of 1896, when the return of prosperity at the close of the century brought about the collapse of the People's Party. The final chapter, an earlier version of which appeared as an article entitled "The Persistence of Populism" in *Minnesota History* for March, 1931, is an admirable summary of the contributions actually made to American life by the Populists.

The Latvian Nation's Mission in European Agricultural History (Jelgava, Latvia, R. Eks, by J. Kromis & Co., 1931), a 16-page pamphlet by J. Mazversits was presented as a lecture before the agricultural faculty of the University of Latvia on January 22, 1931. The author announces a forthcoming volume entitled *Latviešu Lauksaimniecības Kultūras Vēsture* (History of Latvian Agricultural Civilization).

Edward F. Treadwell's *The Cattle King; A Dramatized Biography* (New York, Macmillan Co., 1931. 367 p.) is the life story of Henry Miller, the German immigrant who arrived in San Francisco in 1850 with six dollars and died in 1916 with fifty million dollars, over a million acres of land situated in five states, and a million head of cattle. His chief importance for agricultural history lies in the rôle he played in the agricultural development of the San Joaquin Valley in California.

Frank Lawrence Owsley's *King Cotton Diplomacy; Foreign Relations of the Confederate States of America* (Chicago, Univ. Chicago Press, 1931. 617 p.) is written from the view that "it was primarily England and France with whom Confederate diplomacy and propaganda were concerned, for these two maritime powers held the fate of the Confederacy in their hands—and the Confederacy for over a year, because of its monopoly of the cotton supply upon which these two nations depended, believed that it held the fate of those two countries in its hands." Chapter 2, The Foundations of Confederate Diplomacy, is essentially the same as the author's article entitled "The Confederacy and King

Cotton," in the *North Carolina Historical Review*, 6: 371–397 (October, 1929) and is of particular interest to workers in agricultural history.

Glimpses of High Politics; The Autobiography of N. V. Tcharykow, Serf-owner, Ambassador, Exile (New York, 1931. 330 p.) has been issued by the Macmillan Company with a foreword by Sir Bernard Pares. The description of Tcharykow's grandfather's estate near the Volga, its history and its development is of interest to readers of agricultural history. There is also a chapter on the effect of the manifesto in 1861 which freed the serfs.

ARTICLES

Among articles of importance to readers of AGRICULTURAL HISTORY during the present year may be noted: "The Climates of North America According to a New Classification," by C. Warren Thornthwaite, and "Agriculture in the United States and Russia: A Comparative Stuy of Natural Conditions," by C. F. Marbut, in the *Geographical Review* for October; "Agrarian Discontent in the Mississippi Valley preceding the War of 1812," by George Rogers Taylor, in the *Journal of Political Economy* for August; "Vicissitudes of the American Potash Industry," by Theodore J. Kreps, in the *Journal of Economic and Business History* of August; "Chilean Nitrate and the Nitrate Revolution," by R. H. Whitbeck, in *Economic Geography* for July; "The Ford Museum," by J. G. de Roulhac Hamilton, in the *American Historical Review* for July; "Early Utilitarian Application of Twist in Trees," by Llewellyn N. Edwards, in *Science* for June 19; an editorial entitled "The Passing of Jordan, Comstock, and Pammel [pioneers in agricultural education and research in the United States]," in the *Experiment Station Record* for August; "W. J. Spillman Dies," an obituary and estimate in the U. S. Dept. Agr. *Official Record* for July 25; "Our County Fair, As It Was and Now Is," by Earl Chapin May, in the *New York Times Magazine* for August 30; "The Fate of Some Federal Land Grants and of the United States Surplus Revenue Loan [of 1836]," by Charles N. Lishka, in the *Catholic Educational Review* for Decem-

ber, 1930; "Farm Machinery and the Industrial Revolution," by Harold Underwood Faulkner, in *Current History* for March; "Embattled Farmers," a study of Shays' Rebellion by Walter A. Dyer, in the *New England Quarterly* for July; "A Half Century of Fertilizer Control in Vermont," and "A Third of a Century of Feeding-Stuff Inspection," by J. L. Hills as Vermont Agr. Expt. Sta. *Bulletin 323* and *Bulletin 324*; "Identured Servitude in Colonial New York," by Samuel McKee, Jr., in the New York State Hist. Assoc. *Quarterly Journal* for April, and "The Patroons of New Netherland," by Warren George Sherwood, in the same journal for July; "New York Port and Its Disappointed Rivals, 1815–1860," by Robert G. Albion, in the *Journal of Economic and Business History* for August; "A History of Fruit Growing in Pennsylvania; 1, The Colonial Period, 1623–1827," by S. W. Fletcher, in the *Proceedings* of the second annual meeting of the State Horticultural Association of Pennsylvania for January; "A Typical Virginia Business Man of the Revolutionary Era," by Susie M. Ames, in the *Journal of Economic and Business History* for May, pertaining to Littleton Savage and his account book; "The First Law Regulating Land Grants in French Colonial Louisiana," translated by Henry P. Dart, in the *Louisiana Historical Quarterly* for July; "The Civil War and Social and Economic Changes," by Holland Thompson, and "Adjusting Southern Agriculture to Economic Changes," by David L. Wickens, in the *Annals* of the American Academy of Political and Social Science for January; "The Historical Background of the Present Situation in Southern Agriculture," by Everett E. Edwards, and "The Efficiency of Self-Help: a Socio-Economic Study of Southern Master Farmers," by Wilson Gee, in the *Proceedings* of the Southeastern Economic Association for 1930; "The Overland Movement of Cotton, 1866–1886," by J. L. Waller, in the *Southwestern Historical Quarterly* for October; "Sheep Industry of Southeastern Ohio," by Langdon White and Clyde E. Cooper, in *Economic Geography* for July; "The Land Policy of the Illinois Central Railroad, 1851–1870," by Paul W. Gates, in the *Journal of Economic and Business History* for August; "Ignatius Donnelly," by Louis M. Hacker, in the *New Freeman* for February 11; "Sod

Houses and Prairie Schooners," reminiscences on life in a prairie sod house by William A. Marin, in *Minnesota History* for June; "The Apotheosis of the Old Gristmill," by James F. Bell, the second instalment being on Minneapolis mills, in the *Northwestern Miller* for January 7 and 14; "A Page Turned in Milling History," by Martin E. Newell and giving the story of the Galaxy, Zenith, Petit, and Northwestern flour mills in Minneapolis, in the *Northwestern Miller* for April 8; "Development of the Packing Industry in Iowa," by A. D. Oderkirk, in Armour's Livestock Bureau's *Monthly Letter to Animal Husbandmen* for April; "Farm Trade Centers in Minnesota, 1905–29; A Study in Rural Social Organization," by Carle C. Zimmerman, issued as Minn. Agr. Expt. Sta. Bulletin 269; "Ancient Irrigation Ditches on the Plains," by Joseph B. Thoburn, in *Chronicles of Oklahoma* for March; "The Mississippi River—Asset or Liability," by William H. Haas, in *Economic Geography* for July; "History of Oregon State College, 1865–1907," by John B. Horner, in the *Oregon Historical Quarterly* for March, 1930; series of articles on woolen mills in Oregon by Alfred L. Lomax in the *Oregon Historical Quarterly*, beginning June, 1929; "Agricultural Changes in California, 1860–1900," by Osgood Hardy, in the Amer. Hist. Assoc., Pacific Coast Branch, *Proceedings* for 1929; "San Luis Obispo, California," by John Wesley Coulter, in *Economic Geography* for July.

Articles on Cyrus Hall McCormick and the centennial of his reaper are: "Cyrus Hall McCormick," by Cyrus McCormick, Jr., in the *Country Gentleman* for March; "The Birthplace of an Industry," by A. C. S., in the *Penn. Farmer* for March 14; "A Birthday in Agriculture," by John B. Tuthill, in the *Cornell Countryman* for April; "The Reaper's Celebration," in the *Southern Planter* for June 1; "The Reaper that Wrought a Revolution," by Waldemar Kaempffert, in the *New York Times Magazine* for June 14; "The Reaper—Its Hundredth Birthday," by George F. Jordan, in the *Missouri Ruralist* for July 1; "Centennial of the Reaper," in the *Farmers' Elevator Guide* for July; "The Centennial of the Reaper," by E. S. Bayard, in the *Penn. Farmer* for July 25.

Articles relating to Canada are: "The Selkirk Purchase of the Red River Valley, 1811," by John Perry Pritchett, in the *Journal of Economic and Business History* for August; "The Famine Immigration to Canada, 1847," by Gilbert Tucker and on a phase of the aftermath of the European crop failures in 1845 and 1846, in the *American Historical Review* for April; "Situace Nasich Zemedelců v Kanadě," by Vlaclav Tlapak, in *Nace Zahraničí* for January, and on the Czechoslovakian farmer in Canada; "The Acquisition and Disposal of Lands in Burford Township," by Major R. C. Muir, in the Brant Hist. Soc., *Papers and Records*, for 1930; "The Story of Wheat [in Western Canada]," by E. Cora Hind, in the *Canadian Geographical Journal* for February; "The Mormons of Canada," by Donald U. Buchanan, including material on their agricultural progress in southern Alberta, in its April number; "The Valley of the Peace," by John M. Imrie, and "Wild Rice," by Diamond Jenness, in its June number; "W. H. Merritt and the Expansion of Canadian Railways," by D. C. Masters, in the *Canadian Historical Review* for June; "Canada's Tariff Reprisals against America," by Grant Dexter and J. A. Stevenson in *Current History* for May.

Articles on Great Britain are: "The Manor," by L. C. Latham, issued by the Historical Association as its *Leaflet No. 83;* "The Dawn of Modern Farming," an unsigned analysis of the manuscript account books of Robert Loder, a young Jacobean yeoman of Berkshire, in the *Quarterly Review* for January; "The Place of Agriculture in British National Economy Prior to Adam Smith," by S. J. Brandenburg, in the *Journal of Political Economy* for June; "His Majesty the King as Farmer and Stockbreeder," by William Burkitt, "Development of Stock Farming in Scotland since the Establishment of the Highland Society in 1784," by J. B. Orr, "Early Scottish Agricultural Writers, 1697–1790," by J. A. S. Watson and G. D. Amery, "Prices of Sheep since 1818," and "Prices of Wool since 1818," in the *Transactions* of the Highland and Agricultural Society of Scotland for 1931; "George Baylis and the Implications of His System of Farming," by C. S. Orwin, in *Agricultural Progress* for 1931, p. 51–56; "The Extension

of Temporary Pastures in Arable Farming," by Sir Robert Greig, in the *Scottish Journal of Agriculture* for January; "The Land Utilization Survey of Britain," by L. Dudley Stamp, in *Geography* for March, and the *Geographical Journal* for July.

Articles relating to Europe: "Über das Lob des Landlebens in Virgils Georgica," by F. Klingner and affording an analysis of the themes of Vergil's praise of the farmer and his activities, in *Hermes* for April; "Les Réformes Foncières en Europe Orientales et Centrale; Leurs Causes Économiques et Sociales," by O. Gorni, in *Annales d'Histoire Économique et Sociale* for April 15; "Iceland's Industries," by S. Axel Anderson, in *Economic Geography* for July; Part 4 of "Essai sur la Situation Économique et l'État Social en Poitou au XVI^{e} Siècle," by Paul Raveau, including tables of the price of wheat in Poitiers during 1548–1850, in the third number of *Revue d'Histoire Économique et Sociale* for 1930; "La Vie Créole à l'Île Bourbon pendant la Révolution," by Mareschal de Bieore and depicting the life of a creole planter, in *Revue des Études Historiques* for October–December, 1930; "The Enclosure and Partial Reclamation of the Zuider Zee," by J. W. Thierry, in the *Geographical Journal* for March; "The Drainage of the Zuider Zee," by K. Jansna, in the *Geographical Review*, for October; "Das Staatliche Urbarmachungswerk in der Römischen Compagna," in the *Jahrbuch für Nationalökonomie und Statistick* for January; "L'Instituto Internazionale de Agricultura e il suo Guibileo," by Giuseppe de Michelis in *Vita Italiana* for October, 1930; "Come Nacque l'Instituto Internazionale d'Agricultura," by Noi, in the *Vita Italiana* for September, 1930; "Instit International d'Agriculture," by Laurent Rigotard, in *La Nature* for January 15; "Economic Geography of Spanish Galicia," by Henry W. Howes, in *Geography* for December, 1930; "La Plaine de Vich," by G. de Reparez, Jr., in *Anonales de Géographie* for September 15, 1930; "Böndene i Norge i Andre Halvparten av det 19de Hundrodåret," by Arne Ording and concerning the farmers in Norway in the second half of the 19th century, in *Syn og Segn* for 1931, p. 49–64; "Land Reform in Slovakia," by Stephen Jansak, in the *Slavonic & East European Review* for

March and June, 1930; "Tessedik Mezögazdasági Reformjai," pertaining to the reforms of Tessedik, a Protestant minister of the late 18th century and by Andreas Moissik, in *Magyar Gazdák Szemléjé* for January; "L'Évolution du Régime Agraire de la Bulgarie Contemporaine," by Marcel Emerit, in *Bulletin de la Societé de Geographie de Lille* for July–September, 1928; "Organizacja folwarku na Bialorusi na przelomie 18i 19 wieku," by Stefan Inglot, in *Ekomista* for 1930, p. 105–126, on the organization of a farm in White Russia at the end of the 18th century; "Du Passé à l'Avenir Agricole de la Russie," by A. de Goulévitch, in *Revue Politique et Parlementaire* for January 10; "Economic Aspects of the Agrarian Question in Russia before and after the Bolshevik Revolution," by Cyril Zaitseff, in the *Journal of Economic and Business History* for August; "Mechanization of Agriculture in U. S. S. R.," by Frances M. Earle, in *Economic Geography* for July; "The Russian Peasant and His Masters," by N. V. Tcharykow, in the *Contemporary Review* for April; "The Socialization of Russian Agriculture," by Calvin B. Hoover, in the *Proceedings* of the Southeastern Economic Association for 1930.

Articles relating to Asia, Australia, and New Zealand are: "Agricultural Regions of Asia, Instalment I," by Samuel Van Valkenburg, and "The Geography of Chosen," by John Wright Baylor," in *Economic Geography* for July; "Indigenous Irrigation Works in Peninsular India," by A. V. Williamson, in the *Geographical Review* for October; "The Iwaki Basin: Reconnaissance Field Study of a Specialized Apple District in Northern Honshiu, Japan," by Glenn T. Trewartha, in the *Annals* of the Association of American Geographers for December, 1930; "Geographic Influences on the Dairying Industry of New Zealand, by R. Ogilvie Buchanan, in *Geography* for December, 1930; " 'Squatting' on Crown Lands in New South Wales," by J. F. Campbell, in the Royal Australian Historical Society *Journal and Proceedings* for 1931.